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cavities of *Lycopodium* and the parichnos of fossil genera." In some cases the sporophylls are provided with more or less conspicuous dorsal outgrowths, which have been noted heretofore only in a casual way, but not definitely described. Four types of sporophyll are described: (1) with well developed dorsal flap extending freely downward and protecting the young sporangium immediately below it (as *S. rupestris*); (2) with no dorsal flap, the sporophyll being flat and the sporangium exposed (as *S. spinosa*); (3) with a well developed dorsal projection which is not free but decurrent (as *S. helvetica*); and (4) a series in which the dorsal outgrowth is gradually reduced and lost, each sporophyll more and more completely infolding the sporangium below (as *S. flabel-lata* to *S. apus*).—J. M. C.

Morphology of *Callitris*.—SAXTON,¹³ in continuing his studies of gymnosperms, has given an account of *Callitris*, an Australasian genus of about a dozen species. The one chiefly studied was *C. verrucosa*, but the results doubtless apply to the genus as a whole, since the species are very closely allied. The sporophylls are in alternating whorls of three, each microsporophyll bearing three sporangia, and each of the upper megasporophylls bearing about 15 ovules, the six sporophylls of the ovulate strobilus producing about 60 ovules. The cells of the mature female gametophyte are all binucleate or multinucleate. The archegonia occur in a single group of about 20, never at the apex of the gametophyte, but along the inner side of the pollen tube near its apex. If two pollen tubes are present, two such groups are organized. The proembryo completely fills the archegonium, the arrangement of cells being variable. More than one embryo is formed from a proembryo, and the first two walls are longitudinal, the mature embryo being dicotyledonous. The claim is well substantiated that *Callitris* and *Widdringtonia* are two distinct genera, but that they should constitute a separate tribe (Callitrineae) coordinate with Cupressineae is not so clear.—J. M. C.

Structure of *Mitrospermum*.—Mrs. ARBER¹⁴ has investigated the structure of the platyspermous seed described by WILLIAMSON in 1877 as *Cardiocarpon compressum*, and occurring in the British Lower Coal-measures. The outer fleshy (forming the wing-like extension), stony, and inner fleshy layers are recognized and described. Two opposite vascular strands arise from the expanded bundle beneath the nucellus and traverse the outer fleshy layer in the principal plane of the seed, probably continuing almost the whole length of the seed. The nucellus seems to have been entirely free from the integument, and in one seed a tissue within the embryo sac was observed, consisting of "irregular roundish cells," which of course represent the female gametophyte. The

¹³ SAXTON, W. T., Contributions to the life history of *Callitris*. Annals of Botany 24:557-569. pls. 45, 46. 1910.

¹⁴ ARBER, AGNES, On the structure of the paleozoic seed *Mitrospermum compressum* (Will.). Annals of Botany 24:491-509. pls. 37-39. figs. 2. 1910.